Activity Based Costing and its Applications

DoD CAS
February 2, 2000

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Issues Identified with F/S Costing

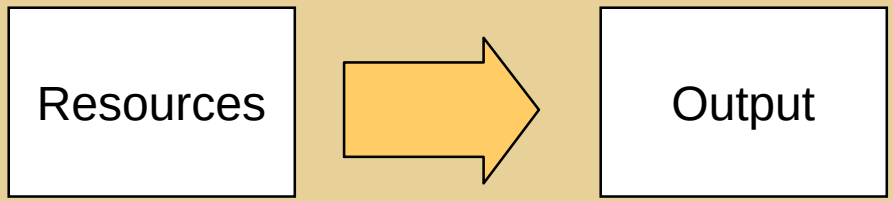
- Correlation of force structure costs and infrastructure costs to mission
- Level of PE detail in force structure costing
- Cross-service contribution to mission

Why Consider ABC?

- Revolution in military affairs encourages businesslike planning and decision making
- Understanding costs is fundamental to achieving the goal of any business

Traditional Costing Methods

Calculate product costs by adding all direct resource costs that can be traced to a specific product and by allocating indirect costs



What was spent

- Direct Materials
- Direct Labor

What was produced

- Products
- Services

Overhead

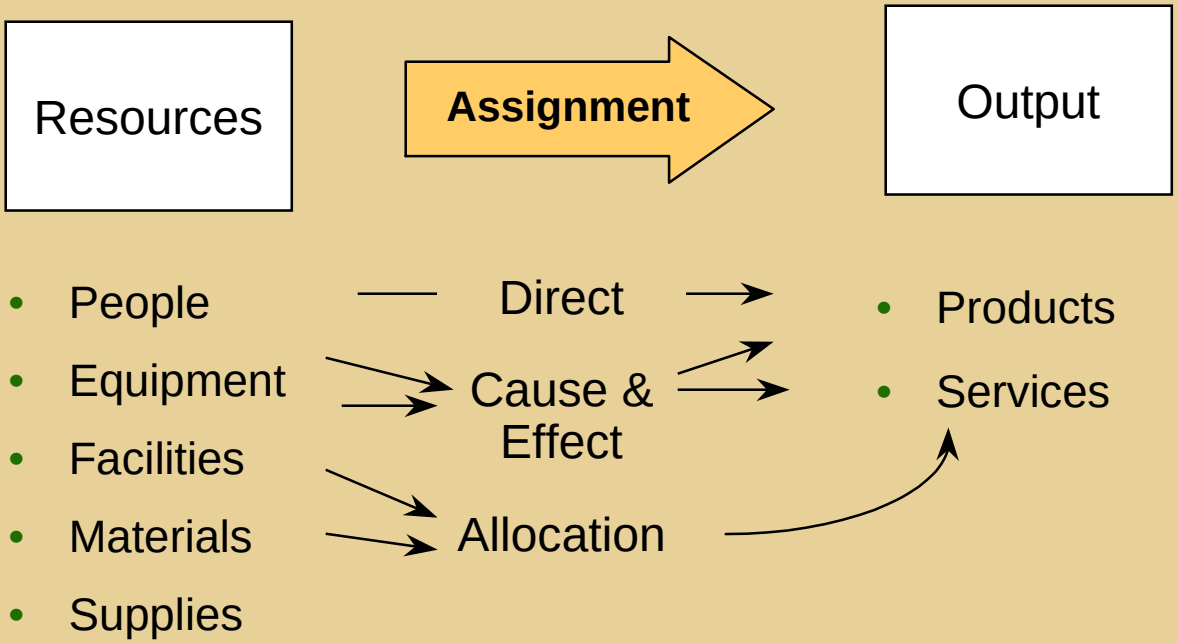
- Indirect Labor
- Indirect Materials
- Facility Costs
- Equipment Costs

What’s the Problem?

- Some products and services demand more overhead than others
- Inaccurate product and service costs -- especially in processes with a lot of overhead and low production quantities
- Lack of pertinent process information to understand performance and assess the impact of improvements

Cost Assignment Methodologies

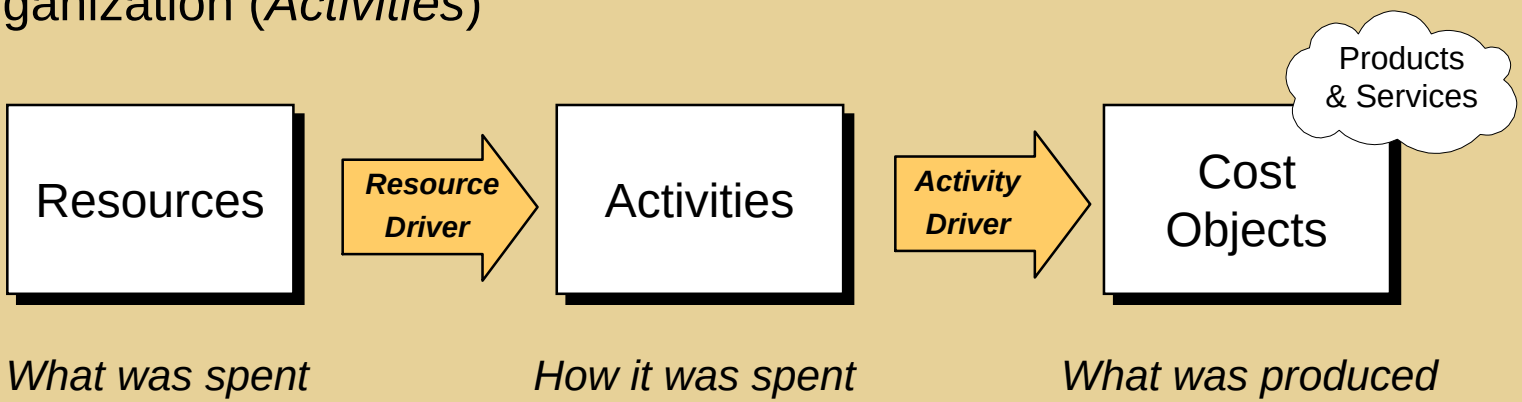
The proper assignment of an organization's resources to determine the cost of providing products and services to customers



Federal Accounting Standards Advisory Board (FASAB), Managerial Cost Accounting Concepts and Standards for the Federal Government (Standard #4), June 1995

What is Activity-Based Costing?

Activity-Based Costing (ABC) is a *Management Tool* that provides insight into the relationship between Inputs (*Resources*) and Outputs (*Products/Services*) by quantifying how work is performed in an organization (*Activities*)



Activities provide a cause-and-effect relationship in order to best assign indirect costs.

Traditional vs. Activity View of Cost

Which would you rather have to run a business?

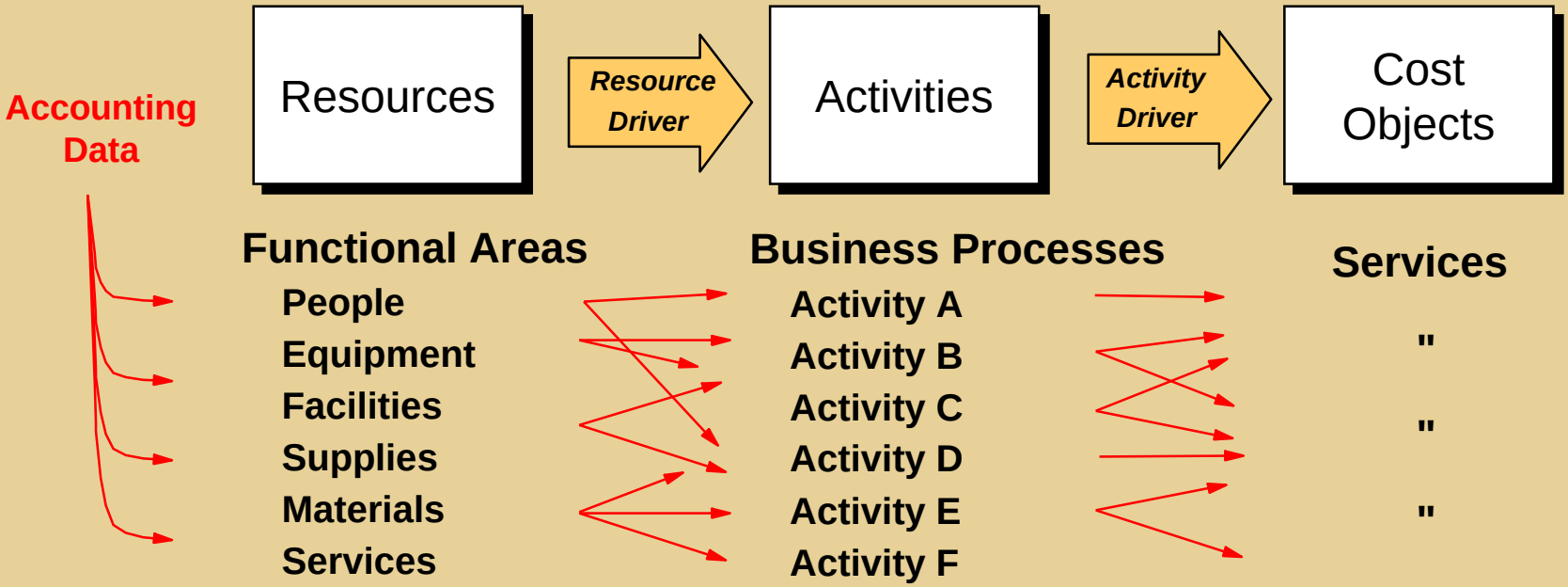
Traditional Object-Class View

Personnel	$50,000,000
POL	8,000,000
TDY	450,000
Transportation	125,000
Rent/Leases	250,000
Utilities	820,000
Communications	175,000
Facility Maintenance	1,250,000
Services	225,000
Supplies	150,000
Equipment	350,000
	$61,545,000

Activity View

Maintain Facilities	$18,500,000
Acquire Supplies	8,350,000
Outfit Ships	27,500,000
Provide Billeting	1,675,000
Develop Budget	450,000
Train Personnel	275,000
Maintain Records	70,000
Operate Comm Center	150,000
Install/Maint Computers	275,000
Operate MWR Facilities	550,000
Provide Medical Care	3,750,000
	$61,545,000

The ABC Model



Measures of Resources: Percent of Time; Square Footage; ADP Run Time; Direct Assignment; etc.

Measures of Activities: Numbers of Outputs, Transactions, Reports, People; Direct Assignment, etc.

Is an ABC Model Accurate?

Traditional Accounting Data

An ABC model

Little to no management information

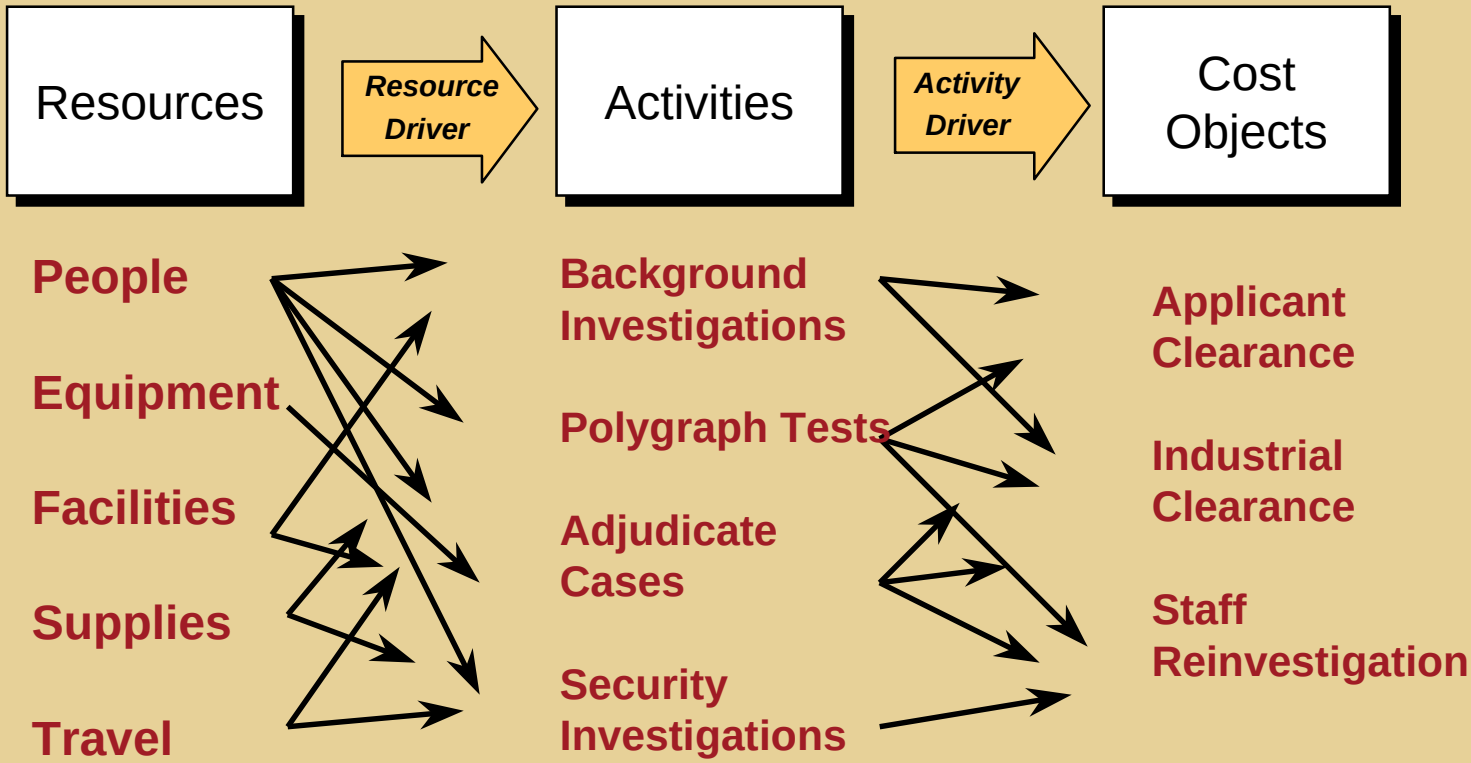
Driven by level of detail:

- Resources
- Activities
- Cost Objects
- Timeframe
- Timeliness

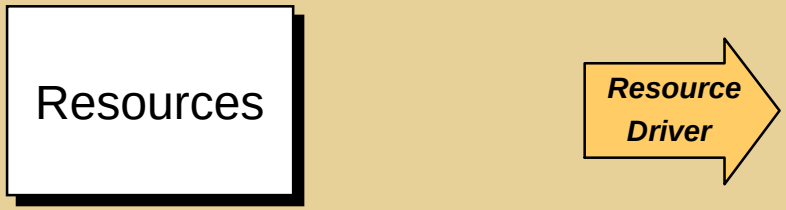
Ability to make meaningful decisions concerning resources and work

ABC Data is MANAGEMENT information -- the focus should be on attaining the right level of precision without draining resources. Over-emphasis on detail will lead to data PARALYSIS, not accuracy.

Example



Assign Resources to Activities

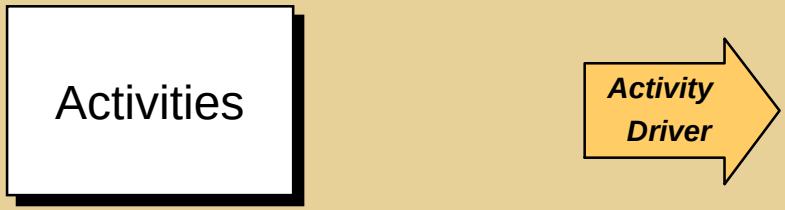


People	**$142,000**	_____
Equipment	**4,500**	_____
Facilities	**30,000**	_____
Supplies	**500**	_____
Travel	**15,000**	_____
	$192,000	

Is the Resource dedicated to one activity? If yes, then assign it directly.

If not, which activities consume this resource and what is the measure (resource driver).

Assign Activities to Cost Objects



Background Investigations _____

Polygraph Tests _____

Adjudicate Cases _____

Security Investigations _____

Is the Activity dedicated to one Cost Object? If yes, then assign it directly.

If not, which cost objects consume this activity and what is the measure (activity driver).

Measure Resources to Activities

First Stage Assignment

	RESOURCES				
	People	**Equipment**	**Facilities**	**Supplies**	**Travel**
	FTE	Direct	Sq Ft	FTE	Trips
ACTIVITIES	40	1	12,000	40	15
Background Investig	14 (35%)		1,200 (10%)	14 (35%)	9 (60%)
Polygraph Test	12 (30%)	1 (100%)	6,000 (50%)	12 (30%)	
Adjudicate Case	5 (12.5%)		3,600 (30%)	5 (12.5%)	
Security Investigation	9 (22.5%)		1,200 (10%)	9 (22.5%)	6 (40%)

Measure Activities to Cost Objects

Second Stage Assignment

		COST OBJECTS		
ACTIVITIES	Activity Driver	**Applicant Clearance**	**Industrial Clearance**	**Staff Reinvestigation**
Background Investig	# applicants	13 (62%)	8 (38%)	
Polygraph Test	# tests	26 (55%)	12 (26%)	9 (19%)
Adjudicate Case	# applicants	13 (48%)	8 (30%)	6 (22%)
Security Investigation	# cases			4 (100%)

Determine Activity Costs

Background Investig	$61,875.00	# applicants	21	$2,946.43
Polygraph Tests	62,250.00	# tests	47	1,324.47
Adjudicate Cases	26,812.50	# applicants	27	993.06
Security Investigations	41,062.50	# cases	4	10,265.62
Total	192,000.00			

Determine Cost Object Costs

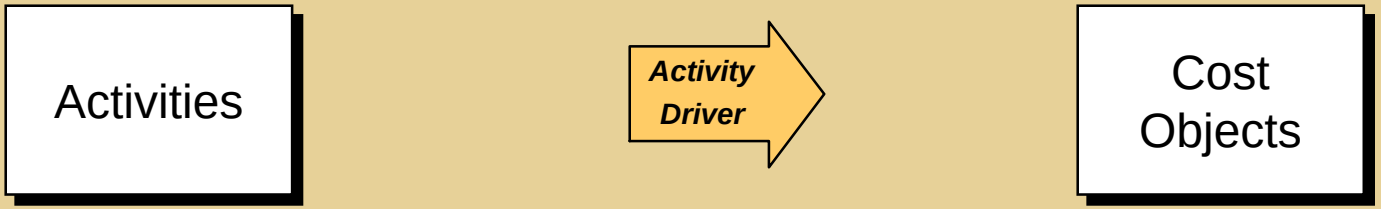
Cost Objects

Applicant Clearance	**$85,649.46**	**# clearances**	**10**	**$8,564.95**
Industrial Clearance	**47,409.49**	**# clearances**	**4**	**11,852.37**
Staff Re-Investigations	**58,941.05**	**# clearances**	**6**	**9,823.51**
Total	**192,000.00**			

The Value of the ABC Costing Method

- Does not require more detailed accounting
- Cost assignments are based on logical relationships
- It can be explained in terms people understand
- Workload changes can be traced back to assess impact on activities and resources

Aircraft Program



Activities	Activity Driver	Cost Objects
System Program Mgmt & Engr		**Airframe**
Lead IPT	**Direct Assignment**	**Datalinks**
Approve Technical Concepts	**“**	**Sensors**
Monitor Contractor Perf	**“**	**Ground Stations**
Perform Tech Oversight	**“**	
Item Management		
Procure Spares & TE	**# Procurements**	
Manage Spares &TE	**# Current Spares**	
Repair Spares & TE	**# Work Orders**	
Contract Management		
Award Contracts	**# Contracts Awarded**	
Manage Existing Contracts	**# Current Contracts**	
Logistics Support		
Provide Warehousing	**CuFt Space**	
Ship Spares # Parts	**# Shipments**	
…etc...		

AFB Logistics Group

14 Resource Pools, by:
- Airwing, Squadron and funding source

Subdivided by 13 Cost Pools
- ADPE
- Aviation Fuels
- Civilian Pay
- Depot Level Repairable Equipment
- Facilities
- Ground Fuels
- Military Pay
- Misc Contracts
- Mission Consumables
- Office Supplies
- Travel
- Utilities
- (Groupings by EEIC)

13 Processes (Activity Groups)
Aircraft Systems and Comp Maint
Engine/APU Maint
Launch and Recover Aircraft
Deployed Mission/Ops Support
AGE Maint
Support/Shop Equipment Maint
Special Purpose Vehicle Maint
General Purpose Vehicle Maint
Vehicle Operations Svcs
Logistics Support Svcs
Contracting Svcs
Supply Svcs
Admin Svcs/Misc Duties

109 Activities

10 Cost Objects
Tenant Aircraft
Transient Aircraft
Aerospace Ground Equip
Support Equipment
General Purpose Vehicles
Special Purpose Vehicles
Engines
Components
Reservist Training

Benefits of ABCM

- **Supports Strategic Decision-Making**
  - Gives economic map of the enterprise
  - Compare process costs to strategic direction
  - Assess impact due to changes in product/service offerings
  - Compare costs of goods and services to prices (competitive benchmarking)
- **Supports Operational Decision-Making**
  - Identify process improvement opportunities
  - Measure organizational impact of process change
  - Understand resource contribution to processes
  - Leverage process best practices (internal and external benchmarking)
- **Improved Planning and Budgeting**
  - Correlate budget changes to resources -- selective vs broad-brush changes
  - Assist in forecasting required resources for program requirements
  - More effectively report to stakeholders/customers

ABCM Strategy

- An ABCM initiative should be able to answer the following:
  - What cost information do I need (ABC data elements)
  - What business problem requires this information (intended decision or action)
  - Why is it important (compelling need)

In the absence of an ABCM Strategy, organizations very quickly question what they are doing and why

Strategy Framework

External Drivers

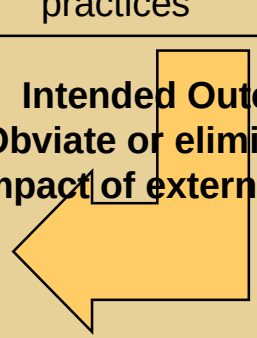
Market Drivers
- Loss of market share
- Changing technology
- Alternative sources
- Alternate technologies
- Significant change in demand
- Losing customers
- Increased competition

Corporate Drivers
- Budget reductions
- Regionalization
- Base/plant closures
- Outsourcing strategy
- Change in mission

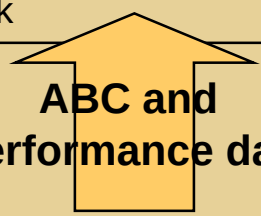
Internal Actions

Business Strategy
- New Marketing Plan
- New business development plan
- Transition to WCF
- Process-centered Mgmt
- Process Reengineering
- Resource Redeployment
- Adopt commercial best practices

Analytic Objectives
- Evaluate profitability
- Pricing/fee setting
- Understand performance
- Unit cost of operations
- Increased throughput
- Reduce cycle time
- Reduce errors/defects
- Improve customer service
- Reduce non-value-added work



Intended Outcome: Obviate or eliminate the impact of external drivers



ABC and performance data

ABC Force Structure Assessment Method (ABC-FSAM)

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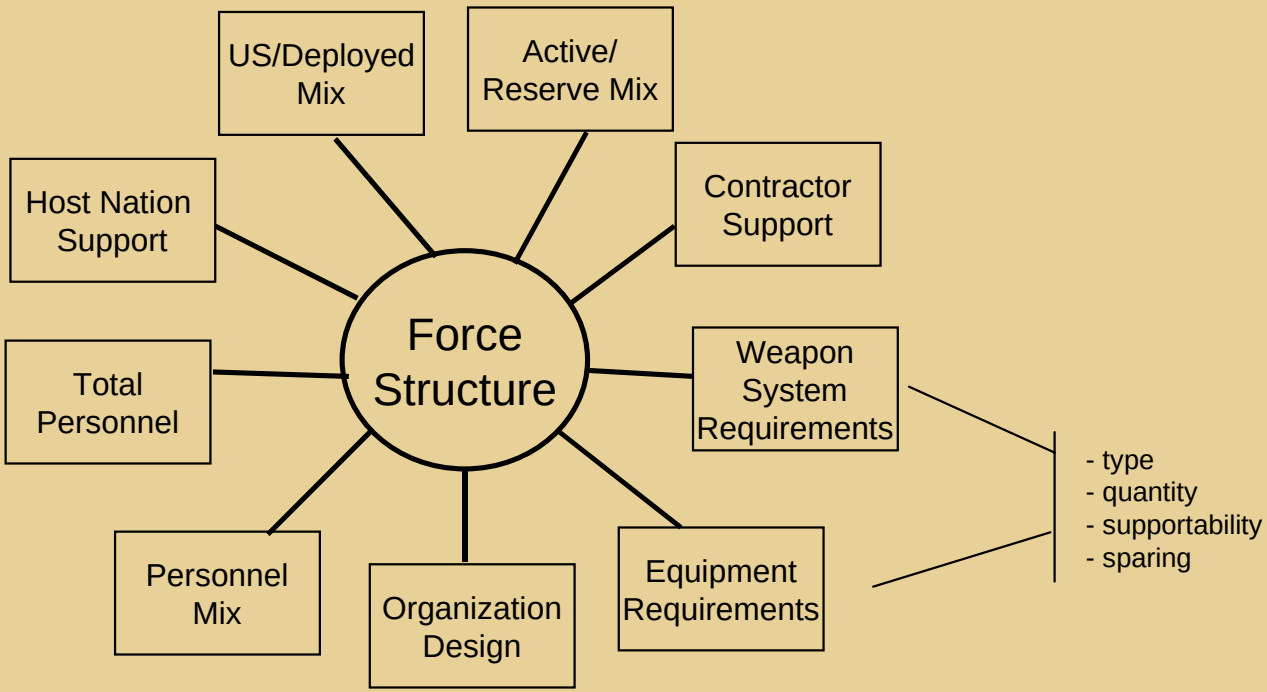
Force Structure

DSMC: "The composition of all Services together, in terms of the number of major combat and support units and their relationship to each other. Generally, this includes equipment and people."



Scope of Force Structure Assessment

Broad vs. Focused

DoD-wide

J-8(Force Structure, Resources, and Assessment)
DUSD (Readiness)
OSD(PA&E)

by Service

Army -- Cost and Economic Analysis Center
Navy -- Center for Cost Analysis, N81
Air Force -- Cost Analysis Agency, SAF/...

by Mission

Examples:
Theater Missile Defense -- BMDO
Command and Control Warfare -- J6, OSD(C3I)
Space -- DUSD (Space)

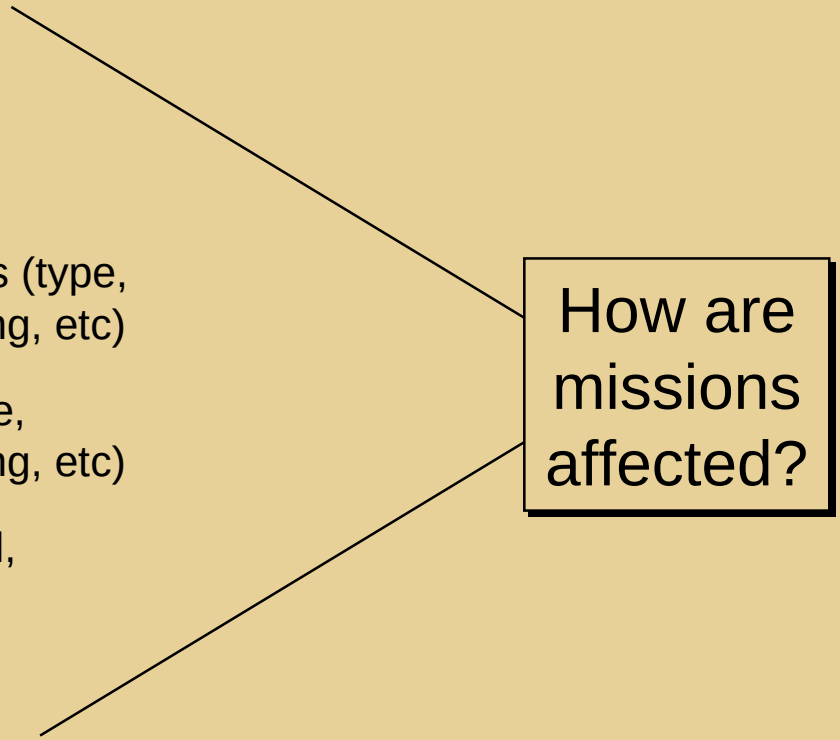
by UCC

Examples:
Central Command
Pacific Command
Space Command

Typical force structure costing exercise

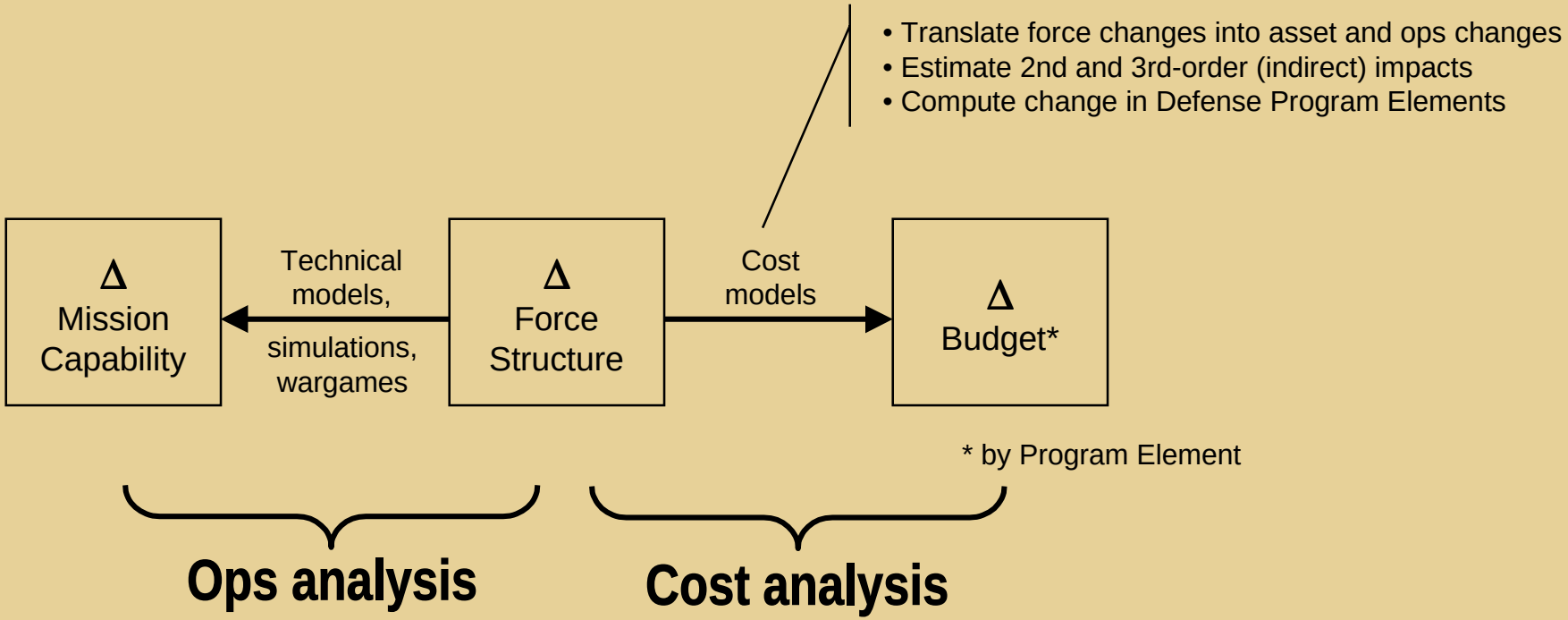
Estimate budgetary impacts of changes in:

- Organizational design
- Total personnel
- Personnel mix
- Weapon system requirements (type, quantity, supportability, sparing, etc)
- Equipment requirements (type, quantity, supportability, sparing, etc)
- Active/reserve mix (personnel, equipment, and weapons)
- US/deployed mix (personnel, equipment, and weapons)



Traditional force structure costing approach

Propose a force structure change, then estimate impact on budget.

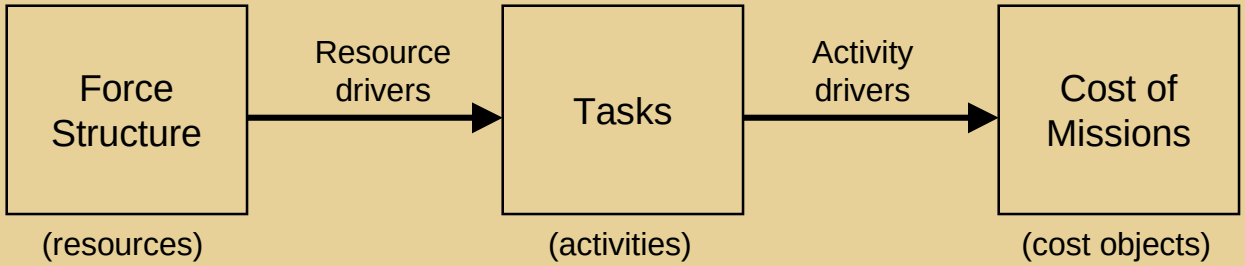


Problems:

- Little visibility into cost of missions
- Two separate analyses are difficult to coordinate, iterate

ABC Approach

Directly estimate the cost of DoD activities that support missions.



Advantage:

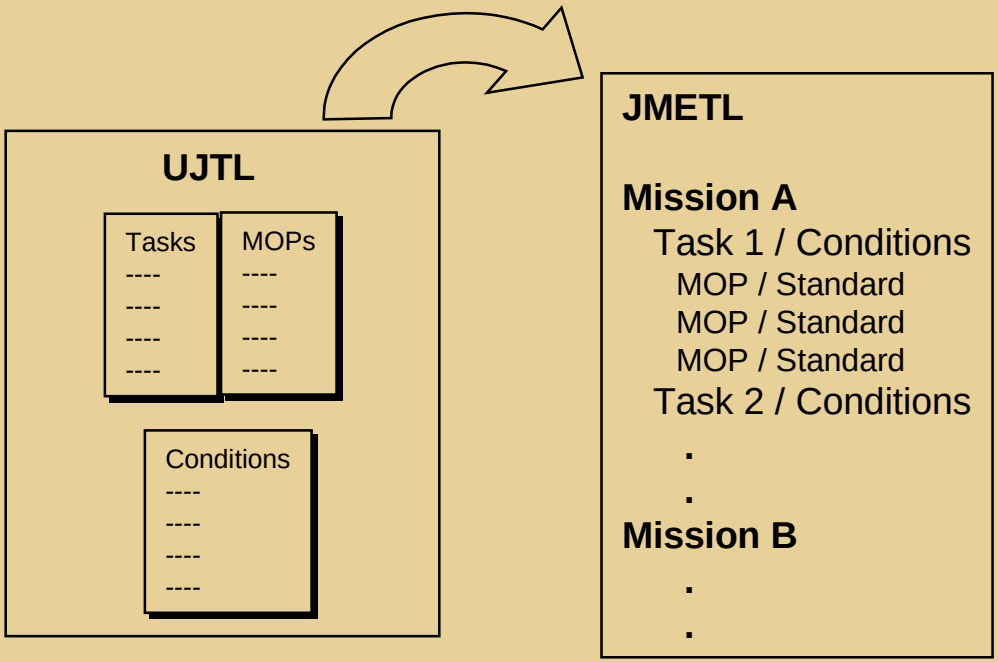
- Full costing, with a direct link between mission activities and all required force-structure resources
- Results in broader, clearer picture of how mission costs are incurred across program elements
- Assigns costs to missions

Universal Joint Task List (UJTL)

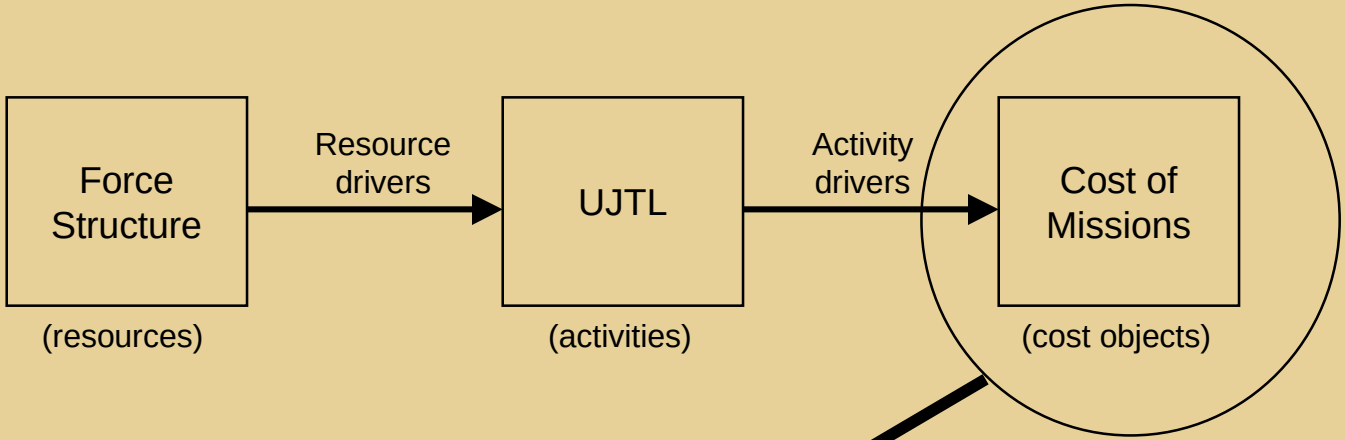
- Provided by CJCS, coordinated with services
- A list of all activities performed by DoD to support readiness and execute missions
- Provides a common terminology for joint planning, training
- Includes measures of performance and conditions
- Not aligned by organization or budget element
- Not a work breakdown structure

Joint Mission Essential Task List (JMETL)

- Provided by Unified Combat Commands
- Maps UJTL tasks, conditions, MOPs, and standards to missions
  - All missions, as assigned to Combatant Commands by the NCA



ABC Results in a Mission-Based Estimate



Mission-Based Estimate

Mission A	**$000**
Task 1 / Conditions	$000
MOP / Standard	
MOP / Standard	
MOP / Standard	
Task 2 / Conditions	$000
.	
.	
Mission B	**$000**
.	
.	

Traditional Method vs. ABC

Traditional Method

Program XYZ

	FY 1	FY 2	...
PE 060nnnnA			
RDT&E	$000	$000	
PE 010nnnnA			
Aircraft Proc	$000	$000	
MILCON	$000	$000	
O&M	$000	$000	
MILPERS			
.			
.			
.			

ABC Method

Mission-Based Estimate

	FY 1	FY 2	...
Mission A	**$000**	**$000**	
Task 1	$000	$000	
Task 2	$000	$000	
.			
.			
Mission B	**$000**	**$000**	
Task 1	$000	$000	
Task 2	$000	$000	
.			
.			

Notional Example: Counterdrug Mission

Traditional Program-Based View

Program-Based View	FY1	FY2	FY3	FY
Counterdrug POM	1570	1570	1570	157
USN (direct costs)				
PE 0601234N	1085	1085	1085	108
Aircraft Proc	400	400	400	40
E2-C Hawkeye	100	100	100	10
S3 Viking	100	100	100	10
F14 Tomcat	100	100	100	10
Pioneer UAV	100	100	100	10
MILCON	250	250	250	25
O&M	400	400	400	40
E2-C Hawkeye	100	100	100	10
S3 Viking	100	100	100	10
F14 Tomcat	100	100	100	10
Pioneer UAV	100	100	100	10
MILPERS	35	35	35	3
Active	25	25	25	2
NG	10	10	10	1
PE 0104567N	485	485	485	48
Ship Proc	100	100	100	10
MILCON	20	20	20	2
O&M	350	350	350	35
MILPERS	15	15	15	1
- - -				
USAF (direct costs)				
- - -				
USA (direct costs)				
- - -				
SOCSOUTH (direct costs)				
- - -				

Notional Example: Counterdrug Mission

Mission / Task (associated UJTL task)	FY1	FY2	FY
Counterdrug mission costs	1775	1775	17
1.0 Provide support to reinforce host nation	65	65	
- - -			
2.0 Coordinate Detection and Monitoring	1510	1510	15
2.1 Plan/coordinate interagency activities	445	445	4
Advise and suppot CD operations (ST 8.4.1)	5	5	
Coordinate and integrate interagency activites (ST 8.5)	50	50	
Determine force needs and solutions (SN 7.1.3)	25	25	
Integrate capabilities and prioritize R&D and acq programs (SN 7.2.2)	15	15	
Conduct demonstration, engineering, development, and production (SN 7.2.3)	350	350	3
2.2 Develop Theater ISR	365	365	3
Plan and direct AOR ISR activities (ST 2.1)	90	90	
Collect theatre information (ST 2.2)	125	125	1
Process and exploit (ST 2.3)	50	50	
Produce intel (ST 2.4)	60	60	
Disseminate intel (ST 2.5)	30	30	
Evaluate intel activities (ST 2.6)	10	10	
2.3 Provide Logistics support	415	415	4
Coordinate the fiing and maintaining of equipment (ST 4.1)	40	40	
Coordinate support for AOR forces (ST 4.2)	25	25	
Distribute supplies/services (ST 4.3)	225	225	2
Maintain sustainment bases (ST 4.4)	125	125	1

ABC View of Cost Objects

Force Structure and Infrastructure Resources

Types of Resources

- Combat
- Combat Support
- Support

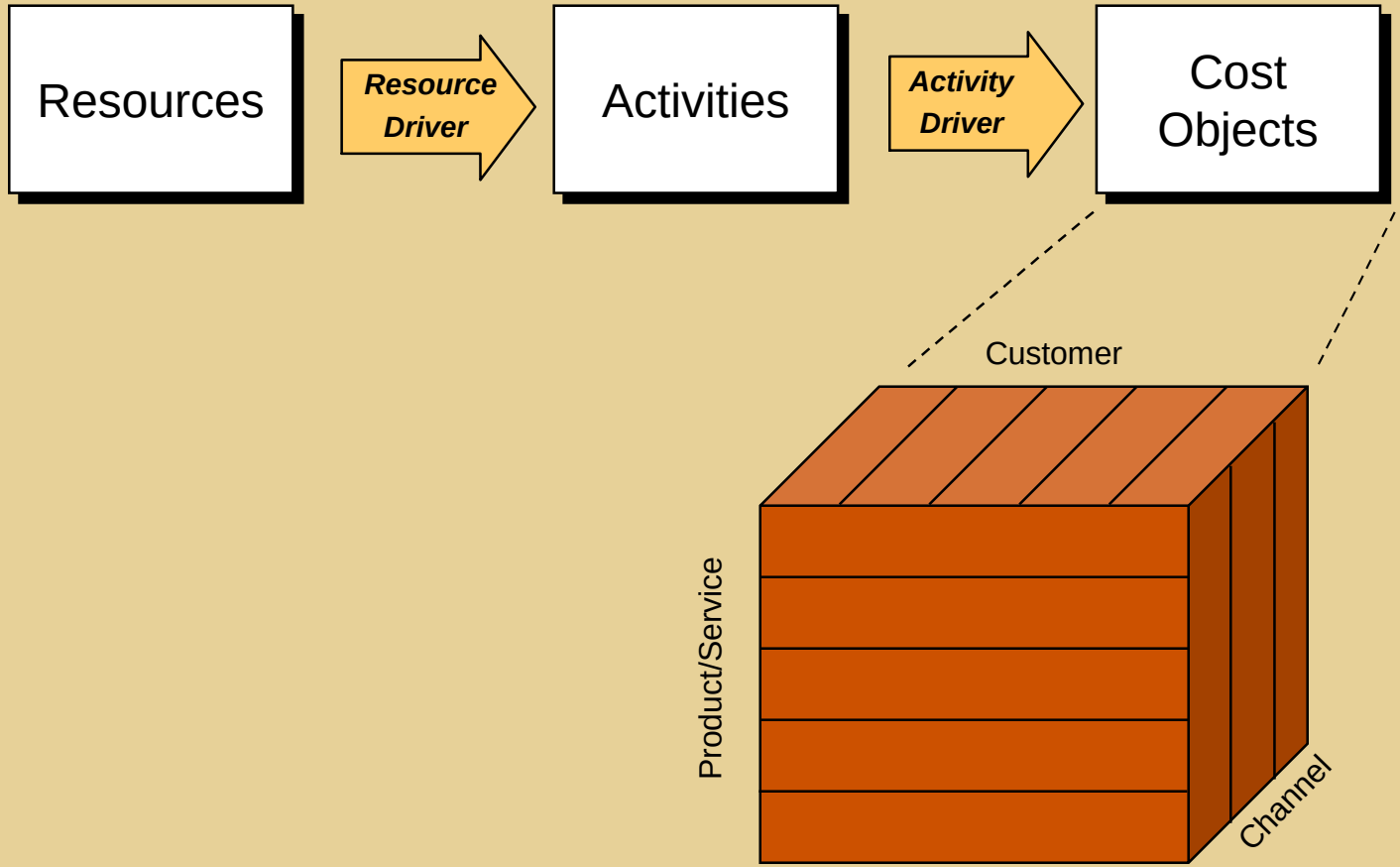
Objective of Activities

⇨ Trace to Mission

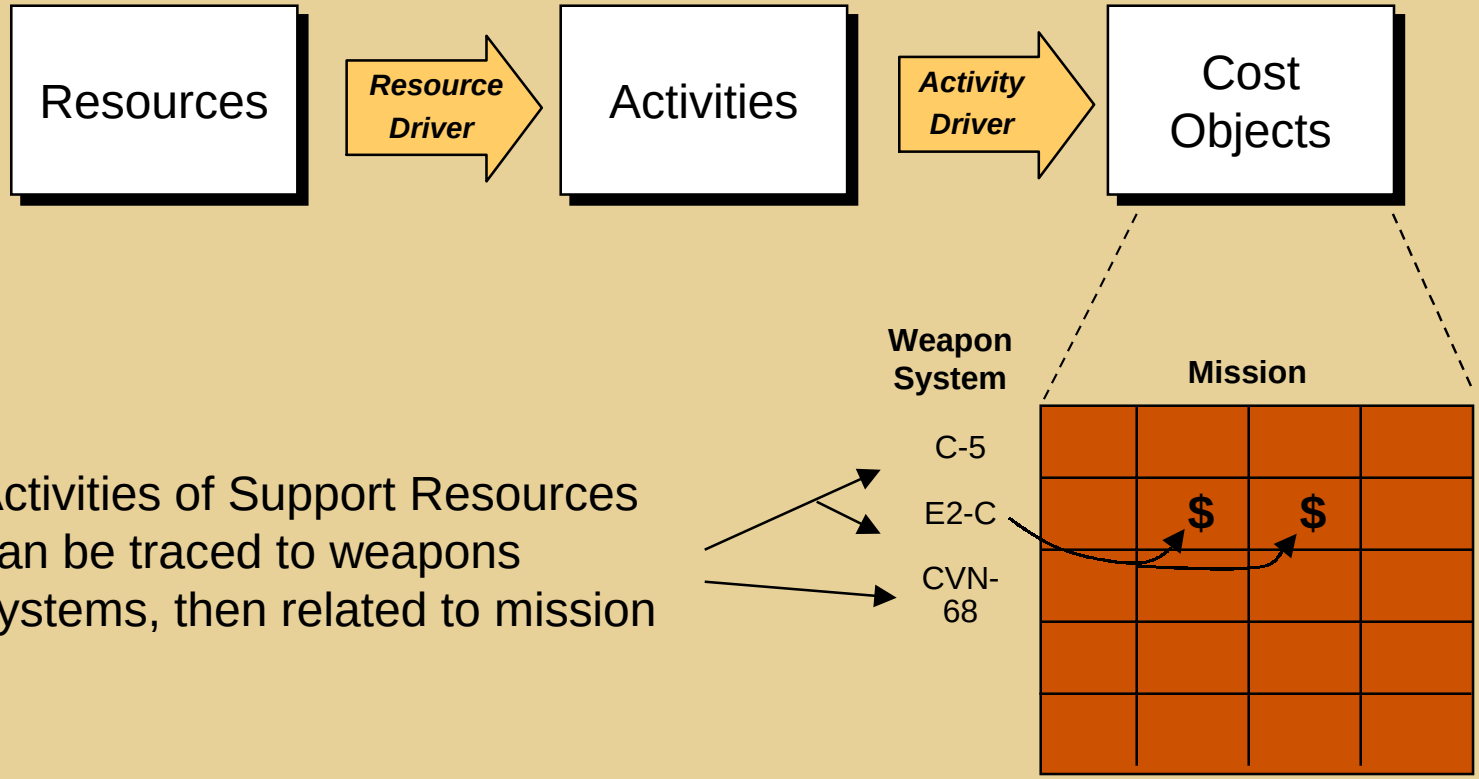
⇨ Causal relationships to mission and/or combat resources

⇨ Causal relationship to combat resources

Multi-dimensional Cost Objects



Support Resources



Activities of Support Resources can be traced to weapons systems, then related to mission

The Potential for ABC in Force Structure Costing

- Leverages existing DoD information (UJTL, JMETL, etc)
- Correlation of force structure costs and infrastructure costs to mission
- Can have a cross-service view of mission costs
- Does not require more detailed accounting (PE detail)
- Cost assignments are based on logical relationships -- explainable